# DOCKING SLEEVE WITH ELECTRICAL ADAPTER

## CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This patent application is a continuation of U.S. patent application Ser. No. 16/831,101, filed Mar. 26, 2020, which is a continuation of U.S. patent application Ser. No. 16/233,662, filed Dec. 27, 2018, which is a continuation of U.S. patent application Ser. No. 15/960,274, filed Apr. 23, 2018, which is a continuation of U.S. patent application Ser. No. 15/195,176, filed Jun. 28, 2016, which is a continuation-in-part of U.S. patent application Ser. No. 14/936,517 filed Nov. 9, 2015, which issued as U.S. Pat. No. 9,706,026, which is a continuation-in-part of U.S. patent application Ser. No. 14/829,378 filed Aug. 18, 2015, which issued as U.S. Pat. No. 9,602,639, which is a continuation-in-part of U.S. patent application Ser. No. 14/754,492, filed Jun. 29, 2015, which issued as U.S. Pat. No. 9,529,387, which is a continuation-in-part of PCT Patent Application No. PCT/US2015/017131, filed Feb. 23, 2015, which claims the benefit of U.S. Provisional Patent Application No. 62/040,037, filed Aug. 21, 2014, and is a continuation-in-part of co-pending U.S. patent application Ser. No. 14/222,320, filed Mar. 21, 2014, which issued as U.S. Pat. No. 9,331,444, which claims the benefit of U.S. Provisional Patent Application Ser. No. 61/943,986, filed Feb. 24, 2014, all of which are incorporated herein by reference.

## FIELD OF THE INVENTION

**[0002]** The present invention relates to a cover for protecting a portable electronic device, and in particular to a flexible cover having an electrical adapter for coupling the device to a docking station.

## BACKGROUND OF THE INVENTION

**[0003]** Protective covers, or 'skins', are generally well-known for protecting a portable electronic device, such as a smartphone, or tablet or another portable electronic device. Such skins are typically somewhat flexible which allows them to be wrapped around to partially envelop a device.

**[0004]** However, known protective covers, or 'skins', are limited in their ability to provide efficient and reliable usage of such portable electronic devices.

## SUMMARY OF THE INVENTION

**[0005]** The present invention is a cover for protecting a portable electronic device that overcomes limitations of the prior art for efficient and reliable usage of such portable electronic devices.

**[0006]** One aspect of the invention is a protective arrangement for an electronic device that includes a flexible cover having a panel and a skirt surrounding the panel, where the panel and skirt form an interior cavity therebetween, and the skirt forming a mouth opening that communicates with the interior cavity that is configured and arranged to receive an electronic device; an adapter fixedly positioned in the flexible cover and having a male plug with connectors extending into the interior cavity of the flexible cover in an arrangement for mating with a female socket of the device and a contactor with contacts adjacent outwardly from the flexible cover and electrically coupled to one or more of the connectors of the plug; and a hard shell configured and arranged to be disposed around at least a portion of the flexible protective cover and having an opening through which the contactor of the adapter is extendable. The hard shell may also include corner openings and the flexible cover may include corner portions configured and arranged to protrude from the corner openings of the hard shell. The hard shell may include at least one button opening and the flexible cover may include at least one soft button configured and arranged to protrude from the at least one button opening of the hard shell.

**[0007]** Another aspect of the invention is a protective arrangement for an electronic device that includes a hard shell configured and arranged to be disposed around at least a portion of the electronic device and having an opening to allow access to an input/output socket of the electronic device; a flexible cover having a panel and a skirt surrounding the panel, where the panel and skirt form an interior cavity therebetween, and the skirt forming a mouth opening that communicates with the interior cavity that is configured and arranged to receive the electronic device disposed in the hard shell; and an adapter fixedly positioned in the flexible cover and including a male plug having connectors extending into the interior cavity of the flexible cover in an arrangement for mating with the input/output socket of the device through the opening in the hard shell and a contactor having contacts adjacent outwardly from the flexible cover and electrically coupled to one or more of the connectors of the plug.

**[0008]** Yet another aspect of the invention is a docking system that includes one of the protective arrangement described above and a docking cradle having a tray configured to receive the protective arrangement and a docking connector having contacts positioned to connect with one or more of the contacts of the contactor.

**[0009]** Other aspects of the invention are detailed herein.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0010]** The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

**[0011]** FIG. **1** and FIG. **2** each illustrate the same invention embodied by example and without limitation as a completely integral one-piece elastomeric protective cover, or skin, in situ as partially enveloping a target portable electronic device, such as a smartphone or tablet or another portable electronic device of the prior art having a port for a docking connector;

**[0012]** FIG. **3**, FIG. **4** and FIG. **5** describe by example and without limitation a docking cradle of a type useful with the protective cover of the invention;

**[0013]** FIG. **6** and FIG. **7** are different views that each illustrate by example and without limitation the protective cover of FIG. **1** with the portable device removed for clarity;

**[0014]** FIG. **8** is a partial cross-section view of the protective cover of FIG. **1** taken through an electrical adapter of the invention;

**[0015]** FIG. **9** illustrates the elastomeric protective cover of FIG. **1** in situ as partially enveloping the target portable electronic device;

**[0016]** FIG. **10** illustrates a plurality of electrical connectors of a male plug of the electrical adapter being mechanically and electrically mated with a female input/output